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Michael B. Leetzow

  
Date of Signature

## **FIREARM SUPPORT SYSTEM**

The present invention relates to a firearm support system to provide a support for the firearm to assist in hunting activities, and more particularly, a firearm support system that allows a hunter to transport and easily install the firearm support system in tree or tree stand.

Currently, most hunters do not have a support system that holds the firearms steady while hunting or they use a stationary gun holder that is either mounted directly to the tree stand or tree. However, both of these options are not very satisfactory when sitting in a tree or tree stand for many hours while waiting for the game to come by the hunter. Additionally, the stationary holder does not allow for easy transport to a different location if the hunter decides to hunt at another location, unless other holders are mounted at the other locations. If the hunter does not have a steady aim on the animal, the hunter may miss the animal or simply injure the animal rather than kill it quickly.

Accordingly, the present invention is directed to a firearm support system that substantially obviates one or more of the problems and disadvantages in the prior art. Additional features and advantages of the invention will be set forth in the description that follows, and in part will be apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention will be realized and attained by the apparatus and process particularly pointed out in the written description and claims, as well as the appended drawings.

### **SUMMARY OF THE INVENTION**

To achieve these and other advantages and in accordance with the purpose of the invention as embodied and broadly described herein, the invention is directed to a firearm support system

comprising an extendable arm, a support element attached to the extendable arm, and a support attachment member to engage a fixed structure and configured to accept at least a portion of the extendable arm.

In yet another aspect, the invention is directed to a firearm support system comprising an extendable arm, the extendable arm having a first end configured to engage a support structure, and a support element attached to a second end of the extendable arm.

In another aspect, the present invention is directed to a firearm support system comprising, an arm configured to be attached to a support structure, and a support element attached to the arm, the support element having a plurality of rest members spaced from one other along the support element to support a firearm.

It is to be understood that the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

The accompanying drawings are included to provide a further understanding of the invention and are incorporated in and constitute a part of the specification. The drawings illustrate several embodiments of the invention and together with the description serve to explain the principles of the invention.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 is an elevational view of a firearm support system ferrule according to one embodiment of the present invention;

Fig. 2 is a side elevational view of the firearm support system of Fig. 1 in a folded position;

Fig. 3 is the other side view of the firearm support system of Fig. 1 in a folded position;

Fig. 4 is a side elevational view of the firearm support system of Fig. 1 in a partially unfolded position;

Fig. 5 is an enlarged partial view of the firearm support system of Fig. 1 illustrating the storage of one embodiment of a support attachment member;

Fig. 6 is an end view of the portion of the support attachment member of Fig. 5;

Fig. 7 is a plan view of the support attachment member installed in a fixed structure according to one embodiment of the present invention;

Fig. 8 is a perspective view of an alternative embodiment of a support attachment member according to the present invention;

Fig. 9 is an end view of the support attachment member of Fig. 8;

Fig. 10 is a perspective view of another alternative embodiment of a support attachment member according to the present invention strapped to a fixed structure;

Fig. 11 is a perspective view of an alternative embodiment of a support attachment member according to the present invention;

Fig. 12 is an end view of the support attachment member of Fig. 11;

Fig. 13 is an elevational view of a firearm support system ferrule according to another embodiment of the present invention in a folded configuration;

Fig. 14 is an elevational view of a firearm support system ferrule according to another embodiment of the present invention;

Fig. 15 is an elevational view of the firearm support system of Fig. 12 in a contracted configuration;

Fig. 16 is an elevational view of a firearm support system ferrule according to another embodiment of the present invention;

Fig. 17 is an alternative embodiment of a rest member with screws stored therein;

Fig. 18 is a partial view of an end of an arm segment of a firearm support system with screws stored therein; and

Fig. 19 is an elevational view of an alternative embodiment of a support element according to the present invention.

### **DETAILED DESCRIPTION OF THE INVENTION**

As illustrated in Figs. 1-7, a firearm support system **10** has an extendable arm **12** that preferably has three arm segments **12a, 12b, 12c** rotatably connected to one another. The firearm support system **10** also has a projection **14** attached to a first end **16** of the extendable arm **12**. The projection **14** is preferably configured as a cylindrical member, as best illustrated in Fig. 5. The projection **14** slides into support attachment member **18**, which in turn attaches to a fixed support structure **20**. The fixed support structure **20** is preferably a tree, but it can be any fixed object, including a bush, a tree stand in a tree or on the ground, a building, etc. The extendable arm **12** also has a support element **22** that is attached to a second end **24** of the extendable arm **12**. The support element **22** preferably has two fibrous elements **26** that extend from second end **24** and have a plurality of rest members **28**. The fibrous elements **26** are preferably made of nylon, but could be made of any durable material such as cotton string, leather or could even be a non-flexible member as described below. The rest members **28** are preferable elongated cylindrical members, but could be of any shape and size. For example, the rest members **28** could have a square, oval, or any other shape cross section. The two fibrous elements **26** are attached at either end of the rest members **28** to secure them at predetermined distances from each other. The rest members **28** are spaced from one another such that the firearm could be rested on the rest members **28** between the two fibrous

elements **26**, or the hunter's hand could rest on them with the firearm resting on the hunter's hand or arm on the outside of the two fibrous elements **26**. It should also be noted that while the rest members **28** are attached that their ends to the two fibrous elements **26**, they could extend beyond the two fibrous elements **26** and still be within the scope of the present invention. The support element **22** could also have a single central support member that engages rest members **28** to support the firearm as illustrated in Fig. 17.

Since the projection **14** is preferably a cylindrical member and the support attachment member **18** has a central lumen **30** that is appropriately sized to slidingly receive the projection **14**, the extendable arm **12** is able to pivot about the central lumen **30** in the support attachment member **18**. This allows the hunter to move the firearm (and the firearm support system **10**) within the hunter's field of view. With a plurality of rest members **28** spaced along the length of the support element **22**, the hunter may alter the angle of the firearm with the ground, depending on the distance of the target from the hunter's position by utilizing the different rest members **28**.

The support attachment member **18** preferably includes two holes **32** in a base plate **36** to receive screws **34**. The hunter typically screws the screws **34** through the base plate **36** and into the fixed support structure **20** using a screw driver head **38** attached to one of the three arm segments **12a,12b,12c**. As shown best in Figs. 2 & 3, the screw driver head **38** is attached to one end of the arm segment **12b**. The hunter then slides the projection **14** into the central lumen **30** of support attachment member **18**. The firearm support system **10** is then ready to use

An alternative support attachment member **18'** is illustrated in Figs. 8 and 9. The support attachment member **18'** is similar to the support attachment member **18**, but has a reduced sized by having the screws **34** and holes **32'** through support attachment member **18** and the central lumen **30'**. By inserting the screws **34** through the holes **32** and the support attachment member **18'**, it

supports the screws **34** in two places during insertion into the fixed support structure **20**. This configuration allows for more support of the screws **34** and easier insertion of the screws **34** into the fixed support structure **20**. Another alternative support attachment member is illustrated in Fig. 10. The support attachment member **18''** has straps **40** rather than screws **34** to secure it to the fixed support structure **20**. The straps **40** are wrapped around the tree and then secured. This method of attaching support attachment member **18** to the fixed support structure **20** eliminates putting holes into the structure.

Another support attachment member **18'''** is illustrated in Figs. 11 and 12. The support attachment member **18'''** is similar to the members described above, but has a rectangular tubular portion **36'** rather than the base plate **36**. In this embodiment, the holes **32''** are only through the rectangular tubular portion **36'**, and not through the cylindrical portion of the support attachment member **18'''**. As the screws **34''** must pass through both sides of the rectangular tubular portion **36'**, the screws **34''** are preferably longer than the screws in other embodiments to account for the thickness of the rectangular tubular portion **36'** and still penetrate the support structure a sufficient distance. The screws **34''** are supported more with the two sides of the rectangular tubular portion **36'**, making it easier for the user to drive the screws **34''** into the tree using only one hand. The holes **32''** are preferably countersunk on the side nearest to the cylindrical portion, to eliminate any potential interference of the screws **34'** with the projection **14**.

It should be noted that the hunter may decide to leave the support attachment member **18** in the tree or other fixed support structure **20** for the next hunting trip. Additionally, the hunter could place several of the support attachment members **18** in various locations so as not to have to continually install and remove the support attachment members **18** each time.

The extendable arm **12** preferably has three arms **12a,12b, 12c** that are rotatably connected to one another, which allows the extendable arm **12** to be folded up and easily carried to and from the hunter's stand. See Figs. 2 & 3. To fold the firearm support system **10**, the three arms **12a,12b,12c** are rotated over and onto one another as illustrated in Fig. 4. In the embodiment in Figs. 1-7, the pivoting of the three arms **12a,12b,12c** are about the bolts **42**. Once the three arms **12a,12b, 12c** are folded, the support attachment member **18** can be mounted to the underside of arm **12c**. Mounting of support attachment member **18** includes inserting the screws **34** into apertures **44** on the underside of arm **12c**. Then two hook and loop type straps **46** are used to hold the support attachment member **18** to the firearm support system **10**. As shown in Figs. 2 & 3, the straps **46** also cover the screws **34** to ensure that they do not fall out during transport and storage of firearm support system **10**. The two hook and loop type straps **46** are preferably secured to the firearm support system **10** so that they do not fall off or become lost during use of the firearm support system **10**. In the preferred embodiment, the straps **46** are riveted to arm **12b**, but they may be secured in any manner, e.g., glued, screwed, welded, with an adhesive, etc. The straps **46** also assist in keeping the firearm support system **10** in a folded configuration.

The support element **22** can then be wrapped around the firearm support system **10** as illustrated in Figs. 2 and 3. Wrapping the support element **22** around the firearm support system **10** also assists with keeping the firearm support system **10** in a folded configuration in addition to making firearm support system **10** more compact overall. While the support element **22** is wrapped around the firearm support system **10** in the figures, it could also simply be gathered and then secured to the firearm support system **10** with the strap **48**. In the compact configuration, firearm support system **10** can be easily transported in a fanny pack or other tote.

As illustrated in Fig. 4, extra screws **34** could be stored in the bottom rest member **28** (or any of the rest members **28**). The extra screws **34** are screwed into the bottom rest member **28**, but may also be stored in a hollow rest member **28'** as illustrated in Fig. 15. Alternatively, the screws **34** could also be stored inside arm **12a** as shown in Fig. 16. It should be noted that the two fibrous elements **26**, which are attached to extendable arm **12** at the second end **24** by knotting each end, block the end of the extendable arm **12b**, keeping the screws **34** inside the second end **24**. Access to the extra screws **34** is as easy as pulling the knotted ends of the two fibrous elements **26** out of the second end **24** of extendable arm **12**. The screws **34** will then fall out of the extendable arm **12b**.

The three arms **12a,12b,12c** are attached to one another by bolts **42**. The bolts **42** are tightened so that the extendable arm **12** does not easily close or collapse during use. While the tight bolts **42** make it hard for the extendable arm **12** to close, it may also be difficult for the hunter to extend the arms **12a,12b,12c**. Therefore, in Fig. 11 an alternative extendable arm **12'** is provided with wing nuts **52** that can be easily loosened during extension and folding, and then tightened to ensure that the alternative extendable arm **12'** does not unexpectedly fold during use. The heads of the bolts **54** with the wing nuts **52** are disposed within the arm **12b'**, allowing the arms to all be the same length since the heads of the bolts **54** are inside the arm **12b**. Additionally, since the heads of bolts **54** are no longer external to the arm **12b'**, the projection **14'** can be oriented so that it does not extend downward away from the extendable arm **12** as in the previous embodiment. This configuration makes for a more compact device.

A portion of another alternative embodiment of a firearm support system according to the present invention is illustrated in Fig. 12. An extendable arm **56** extends in a telescopic manner rather than in a folding manner as in the previous embodiments. While the preferred embodiment has three arms **56a,56b,56c** that are telescopically connected to one another there could be any



number of arms or segments. The extendable arm **56** may also have a projection attached to one end to engage a support attachment member as in the previous embodiment. A screw driver **58** head may be installed on the other end of the extendable arm **56** for installing screws into a fixed support structure **20**. The extendable arm **56** would also have a support element (not shown) as in the prior embodiments.

Another embodiment of firearm support system according to the present invention is illustrated in Fig. 14. The extendable arm **58** would be a unitary (not foldable or telescoping) member that can be secured to the support attachment member with projection and support attachment member as in the prior embodiments, or with the end **60** as illustrated in Fig. 14. The end **60** has threads **62** located on its periphery to allow the extendable arm **58** to be screwed directly into the fixed support structure. Alternatively, extendable arm **58** may also have the other attachment elements (e.g., the projection and support attachment member) discussed above with respect to the other embodiments.

It will be apparent to those skilled in the art that various modifications and variations can be made in the firearm support system of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.